ABSTRACT

Relatively powerful hand-held computing devices, Digital Signal Processors, Audio signal processing technology, voice recognition technology, expert systems, Hidden Markov Models, and/or neural networks are employed in a device capable of real-time automated species identification by listening to bird vocalizations in the field, analyzing their waveforms, and comparing these waveforms against known reference samples. An apparatus for identifying animal species from their vocalizations, comprises a source of digital signal representative of at least one animal candidate vocalization; a feature extractor that receives the digital signal, recognizes notes therein and extracts phrases including plural notes and that produces a parametric representation of the extracted phrases; and a comparison engine that receives the parametric representation of at least one of the digital signal and the extracted phrases, and produces an output signal representing information about the animal candidate based on a likely match between the animal candidate vocalization and known animal vocalizations. A computer-implemented method of identifying animal species, comprises: obtaining a digital signal representing a vocalization by a candidate animal; transforming the digital signal into a parametric representation thereof; extracting from the parametric representation a sequence of notes defining a phrase; comparing the phrase to phrases known to be produced by a plurality of possible animal species; and identifying a most likely match for the vocalization by the candidate animal based upon the comparison. The comparison engine or comparison function may use Hidden Markov Models, expert systems and/or neural networks.